

The routine insertion of drains after total thyroidectomy by harmonic scalpel, is it always necessary?

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Abstract

Background and objective: Routine use of drains after thyroidectomy is not evidence based; nevertheless most surgeons use drains to alert them to the presence of postoperative bleeding and for the prevention of hematoma and seroma. This comparative study was conducted to evaluate the necessity of routine drainage after total thyroidectomy.

Methods: A total of 150 patients who underwent total thyroidectomy due to different indications at different hospitals in Erbil city, Iraq from June 2011 to December 2015, were included. A retrospective comparison was made between those drained (group 1) and those without drain (group 2). Operating time, postoperative complications and hospital stay were assessed.

Results: Operation time was significantly less in group 2 compared to group 1; 64.9 ± 7.64 minutes versus 73.8 ± 9.81 minutes, respectively. There was no statistically significant difference in the incidence of postoperative complications. Only two patients, both from group 1, developed a postoperative hematoma. Wound infection occurred only in 2 patients in group 1. Hospital stay was significantly shorter in group 2 compared to group 1; 21.1 ± 3.98 hours versus 41.7 ± 8.64 hours, respectively.

Conclusion: The routine use of drain is not necessary after total thyroidectomy; it increases the hospital stay and may increase the rate of postoperative sepsis.

Keywords: Drain; Thyroidectomy; Harmonic scalpel; Complications.

Introduction

Traditionally many surgeons advocate draining the neck routinely after thyroid surgery.¹ Although several prospective randomized reports regarding the function of the drains in thyroid surgery have not justified their use,² most surgeons still employ routine drainage of the thyroidectomy bed. The main reason proposed for the drainage is to avoid wound hematoma and seroma and, therefore, prevent the resulting airway compression and obstruction.^{3,4} This belief is further reinforced by the fact that the postoperative drains usually yield fluid. However, a common problem is that the drains become blocked with clotted blood and are useless in alerting the surgeon even if a major bleeding occurs, and studies failed to show that placement of

drain prevents the hematoma formation.⁵ There are very low chances of postoperative seromas forming in the absence of drains but they can be observed and allowed to resorb themselves or, if severe, aspirated.^{5,6} The harmonic scalpel uses high frequency mechanical energy to cut and coagulate tissues and vessels simultaneously without the need for knot tying.⁷ The effectiveness and efficacy of the harmonic scalpel in thyroid surgery have been sufficiently demonstrated in the literature. This technique is associated with a significantly lower overall incidence of complications with a statistically significant reduction of cases of postoperative bleeding and seroma.⁸ The debate on the necessity of drains after thyroid surgery is compounded by the belief that they can cause severe

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infective complications and may prolong hospital stay.⁹⁻¹¹ Thus, we conducted this study to determine the feasibility and safety of thyroidectomy without drainage.

Methods

The medical records of 150 patients who underwent total/near total thyroidectomy by using the harmonic scalpel, due to different indications at different hospitals in Erbil from June 2011 to December 2015, were retrospectively reviewed. A comparison was made between those for whom a drain was left in the thyroid bed after the procedure (group 1) and those for whom no drain was used (group 2). Total thyroidectomy defined as removal of both lobes and the isthmus was performed for the majority of the patients, while only three patients underwent a near total thyroidectomy where a small amount of thyroid tissue were left behind on one lobe. The thyroidectomies were performed by the same surgical team. The review of the data was approved by the ethics committee of the **College of Medicine**, Hawler Medical University, Iraq. Informed surgical consent was obtained from all patients after explaining the surgical procedure and the possible postoperative complications. Indications for surgery were multinodular goiters, solitary thyroid nodules, Graves' disease, toxic nodular goiter and toxic nodule. Patients with thyroid cancer or recurrent goiter were excluded from the study. There were no patients with coagulopathy. Routine hematological tests were done in all patients, in addition to thyroid function test, ultrasound of the neck to detect the composition and the size of the nodules. Fine needle aspiration was done in cases of solitary nodules and dominant nodules in multinodular goiters. Patients with toxic thyroids were evaluated and prepared to surgery after controlling their hyperthyroid status. All patients received a prophylactic third generation cephalosporin with the induction of anesthesia. This was repeated once after 12 hours in patients without drains, and

every 12 hours until the drain was removed in patients with drains. All procedures were done by the same surgeon. A standard total thyroidectomy was done in the majority of cases. The harmonic scalpel (Harmonic® Ethicon Endo-surgery gen 4) was used for dissection of the pretracheal fascia, and the ligation and division of all superior, middle and inferior thyroid veins and the branches of the superior and inferior thyroid arteries. Hemostasis near the recurrent laryngeal nerves was done by using bipolar electrocautery whenever deemed necessary. The thyroid gland was dissected off the trachea by using the harmonic scalpel. In the drained group, a suction drain was inserted and was brought out from one side of the operation wound. The wound was closed by a subcuticular prolene 2-0 thread. The operation time was defined from the time of the first incision to the completion of the skin subcuticular suture. Postoperatively the patient was monitored for vital signs and any complications that might occur and postoperative analgesics and antiemetic were given accordingly. The drains were removed after 24 hours if the amount of discharge was less than 20ml and after 48 hours if more and the patient was discharged the same day of the drain removal. The patients were discharged on oral antibiotics and analgesia. The following variables were monitored and recorded: demographic characters, indications for surgery, operation time, duration of hospital stay postoperatively, postoperative voice change, hypocalcaemia, wound infection, seroma and hematoma. Statistical analysis was performed using the statistical package for the social sciences (version 19). Results are expressed as means with standard deviation and proportions. Student's t-test was used to compare between two means. Chi square test was used to compare between proportions while Fisher's exact test was used when the expected count of more than 20% of the cells of the table was less

than 5. *P* value ≤ 0.05 was considered statistically significant.

Results

Out of the 150 patients in the study, 135 (90%) were females and 15 (10%) were males with a mean age of 41.18 ± 12.47 years. Drains were placed in 76 patients (group 1) and were not placed in 74 patients (group 2). There was no statistically significant difference in the mean age between the two groups, while males were less in group 2. The commonest indication for surgery was multinodular goiter accounting for 56% of the cases, including two huge goiters extending retrosternally in the no drain group. There was no statistically significant difference in the preoperative diagnosis between the patients of the two groups (Table 1). The mean operation time was shorter significantly in group 2 (64.9 ± 7.64

min) than in group 1 (73.8 ± 9.81 min), and the mean duration of postoperative stay was significantly shorter ($P < 0.001$) in group 2 (21.1 ± 3.98 min) than in group 1 (41.7 ± 8.64 min). There were only two cases of bleeding postoperatively (1.3%), both happened in group 1 patients and both developed hematoma superficial to the strap muscles. One of them needed evacuation under general anesthesia, while the later responded to conservative observation. Transient hypocalcemia was developed in 12 patients, and they were treated by calcium supplement and followed up. There was no injury to the recurrent laryngeal nerve, though paresis had happened in 20 patients and all recovered their voices within varying times. Only two patients developed wound infection in group 1. Thus the difference in the incidence of complications between the two groups was not significant (Table 2).

Table 1: Demographics and indications for surgery.

Variable	Total	Group 1 (n=76)	Group2 (n=74)	P value
Demographics				
Age (\pm SD)	41.18 \pm 12.47	40.22 \pm 10.86	42.18 \pm 13.94	0.34
Sex (female) (%)	135(90)	64 (84.2)	71(95)	0.017
Indication for surgery				
MNG (%)	84(56)	40 (52.6)	44 (59.5)	0.338
Solitary Nodule (%)	34(22.7)	21 (27.6)	13 (17.6)	0.338
Graves' disease (%)	19(12.7)	10 (13.2)	9 (12.2)	0.338
Toxic MNG (%)	13(8.7)	5 (6.6)	8 (10.8)	0.338

MNG Multinodular goiter

Table 2: Operation time, hospital stay and complications.

Variable	Group 1 (n=76)	Group2 (n=74)	P value
Operation time (\pm SD)	73.8 \pm 9.81	64.9 \pm 7.64	<0.001
Hospital stay (\pm SD)	41.7 \pm 8.64	21.1 \pm 3.98	<0.001
Complications:			
Bleeding (%)	2 (2.6)	0 (0)	0.497
Seroma (%)	0 (0)	0 (0)	NA
Hypocalcaemia (%)	5 (6.6)	7 (9.5)	0.658
Voice change (%)	13 (17.1)	7 (9.5)	0.267
Wound infection (%)	2 (2.6)	0 (0)	1

NA Not applicable

Discussion

Drains are still routinely used after thyroidectomy by many surgeons mostly based on tradition and not on evidence. The aim of leaving a drain is to obliterate the dead space left behind after thyroidectomy and would evacuate the blood and seroma and would alert the surgeon about a possible postoperative bleeding and prevent a tension hematoma that would cause a respiratory failure.¹² This traditional based teaching and practice has been challenged by many randomized trials,^{1,5,9,10,13,14} which clearly show no evidence of using drains after thyroidectomy significantly improves patient outcomes and is far less important than the surgeons' experience and meticulous hemostasis.⁹ The frequency of postoperative hematoma among published thyroidectomy studies ranges from 0 to 3%.¹⁵ In our study, it was 1.3% as it happened in two patients in the drained group as the drains did not prevent their formation. A metaanalysis conducted by Corsten et al. reached the conclusion that suction drain use in thyroid surgery to prevent hematoma formation is not evidence based.¹⁶ There was no seroma formation in any of our patients, and studies show the absence of fluid in the thyroid bed by ultrasound examination¹⁴ while its presence in the suction drain may be due to the drain itself. Inflammatory reaction excited by drains may result in formation of fluid in the drained area⁵ and the vacuum created by the suction drain may prevent the lymphatics from sealing off thus cause increase in seroma formation and drainage.¹⁴ Some of the authors have recommended using drains selectively in cases of huge goiters where there is extensive dissection and a relatively large dead space⁹ but we didn't use drains in two very large goiters without having any complications. Other authors recommend the use of drains in cases of hypervascularity situations like in Graves' disease.^{17,18} However, our results clearly show that drains can be safely omitted in

cases of Graves' disease and toxic nodular goiters. In this study, postoperative wound infection was not common as only two patients developed it in the drain group. Although this result is not significant enough to make conclusions based on, we believe that there is probably a relation between wound infection and applications of drain, and this has been documented by other studies.^{2,13} Our study also suggests that the application of drains after thyroidectomy increases the hospital stay of the patients. Drain group patients stayed significantly longer than the no drain group patients with the mean average of 21.1 ± 3.9 hours versus 41.7 ± 8.6 hours. Similar results were observed by other authors.^{1,2,6,9,10,19} The shorter the duration of hospital stay will decrease bed occupancy and the overall costs. The incidence of other complications was not different between the two groups, though the insertion of drains has no effect on the etiology of these complications such as hypocalcaemia and voice change. There was a time when thyroidectomy was described as a "horrid butchery" by Gross²⁰ and its practice was banned by the French Academy of Medicine in 1850.²¹ Thyroid surgery has changed since then, thanks to the works of the like of Theodor Kocher who reported mortality rate of 0.2% and was awarded the Noble prize in 1909 for his work on thyroid gland.²² Since then thyroid surgery has evolved with many changes in the practice and additions to reduce complications like bleeding. The evidence shows that drain use after routine thyroid surgery does not confer a benefit to patients.²³ We believe it is about time to abandon the tradition based practice of routinely draining the thyroid bed after its removal.

Conclusion

The present study concludes that routine insertion of drains after thyroidectomy is not necessary and can't substitute meticulous hemostasis, adequate anatomic display, and sound surgical judgment.

Drains increase the hospital stay, operation time, and may be associated with an increased incidence of postoperative infective complications.

Conflicts of interest

The author reports no conflicts of interest.

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